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USDA reports studies on BEEF GRADES and CARCASS YIELDS

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U.S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Livestock Division Washington, D.C.

USDA Reports Studies on--
BEEF GRADES AND CARCASS YIELDS

Why do we need grades for beef animals and carcasses? Primarily to measure and identify important differences between carcasses. The important differences, of course, are those that have an effect on the value of the carcass.

Another reason for the grades is to give producers a guide to consumers' desires. Through consumer purchases of the various grades, producers can judge the kinds of meat in demand and aim their production and marketing at meeting this demand.

Factors That Affect Value

Two primary factors that affect the value of a beef carcass are:

1. the quality of its lean meat, and

2. how much of its weight can be sold as trimmed retail cuts.

USDA beef grades are designed to measure these two factors. Quality--that is, juiciness, tenderness, and flavor--is judged on the basis of marbling, firmness, color, and texture of the lean, all in relation to the maturity of the animal from which the carcass was derived. These are factors which research has shown to have an effect on meat quality.

Yield of retail cuts, under the present beef grading system, is judged only on the basis of conformation. Conformation means thickness of muscling and the proportionate development of the various parts of the carcass. Although other factors have an effect on yield, they are not now included in the grade standards.

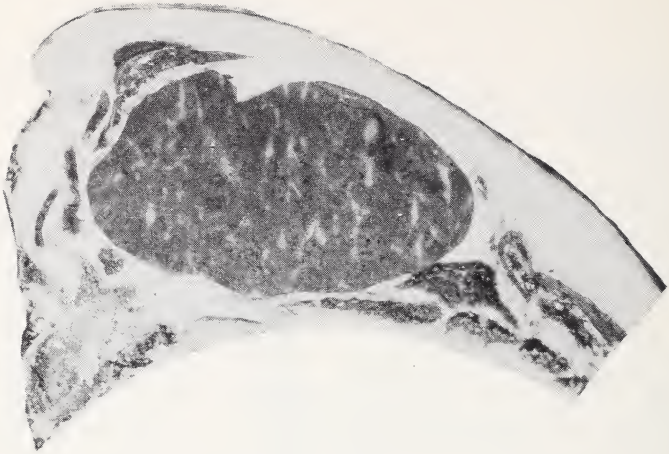
In the present grading system carcasses are given a single grade based on both conformation and quality.

What About Fat?

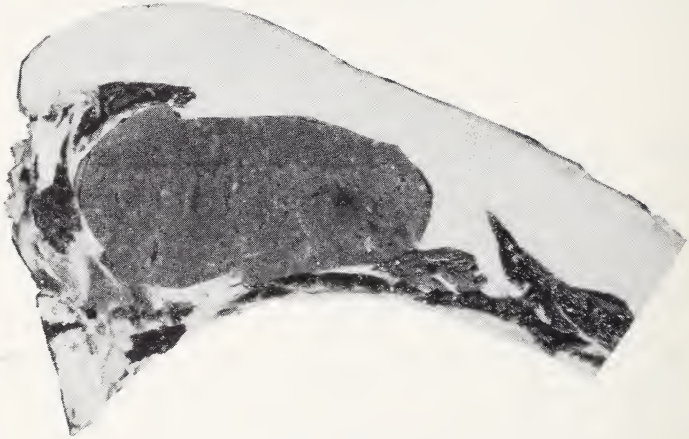
Consumers today want high quality meat--but they have a decided aversion to fat. So retail cuts of beef must be closely trimmed, often resulting in considerable waste and a lower yield of salable meat.

This fact has made the amount of fat on beef animals an increasingly important value-determining factor--or to put it another way--has made the amount of lean meat a carcass will yield more important than formerly.

The amount of fat over the outside of the carcass, however, is given no direct consideration in the present grading system. Furthermore, the amount of fat covering is not highly correlated with quality, nor with conformation. For this reason, there is often a wide variation in fatness (and yield of retail cuts) between carcasses within the same grade. While conformation does serve as an indication of yield, the amount of fat covering can more than offset the effect of conformation. Although most Prime grade beef has more fat than most Good grade beef, this is not always the case--as you can see in the two rib eyes illustrated.



PRIME



GOOD

Prime beef can be produced with a minimum of outside fat.

This Prime grade carcass would be much more valuable to the retailer than would the Good, not only because of its higher quality but also because of its higher proportion of lean and less waste fat.

Studies on the Problem

To meet today's demand for high quality lean meat--and avoid the waste of excess fat--all segments of the beef industry are looking for ways to produce high quality carcasses which will yield the maximum amount of lean meat in the preferred cuts--in other words, the meat-type steer.

In response to the beef industry's concern with this problem, the U. S. Department of Agriculture, as well as several agricultural colleges, has been studying carcasses and live cattle to develop ways of identifying differences in yields of retail cuts.

USDA technicians, in their studies of more than 1,000 carcasses, have demonstrated that carcasses of the same grade and weight can vary widely in their yield of lean meat in the preferred cuts--and hence in their retail value.

The difference in value between carcasses, in extreme cases, can be more than $150. A difference of $50 between carcasses is not unusual. The studies have shown that in higher grades each one percent increase in the carcass yield of the preferred retail cuts increases the carcass value by approximately $1.25 per hundredweight (1959-60 prices).

As to methods of recognizing these differences in yield, the studies demonstrated that these could be predicted quite accurately by using only four factors:

1. thickness of fat over the rib eye;

2. the size of the rib eye muscle;

3. the amount of kidney and pelvic fat; and

4. carcass weight.

Additional studies on some 500 slaughter cattle have demonstrated that differences in yield of retail cuts can be recognized in the live animal with workable accuracy. Eighty percent of the estimates for yield of retail cuts made on the live slaughter cattle were within 2 percent of the estimated carcass yields.

"Dual" Grading--What Is It?

"Dual" grading refers to a system of grading that would provide two separate identifications of value--a quality grade and a "yield" grade.

"Dual" grading is not a Department of Agriculture proposal at the present time. Various systems of utilizing the "dual" grading principle have been studied and tested by the Department and have been demonstrated to the industry for its evaluation.

Here's how one system tested would work. The present grade names would continue in use to indicate a quality grade. In determining this grade, conformation would not be considered. However, it would be a factor in determining a yield grade. The yield grades would be indicated by numbers from 1 to 10, with No. 1 representing the highest yield and No. 10 the lowest.

These two grades would be determined separately, independent from each other. Thus, regardless of the quality grade, carcasses in yield grade No. 3, for example, would yield the same percent of their weight in trimmed boneless retail cuts from the round, loin, rib, and chuck. The combined yield of these cuts accounts for about 80 percent of the value of the carcass.

QUALITY GRADE	YIELD GRADE
Marbling	Fat over rib eye
Color	Kidney fat
Texture	Area of rib eye (a measure of conformation)
Firmness	
Maturity	Carcass weight
(Prime, Choice, Good, etc.)	(1, 2, 3, 4, etc.)

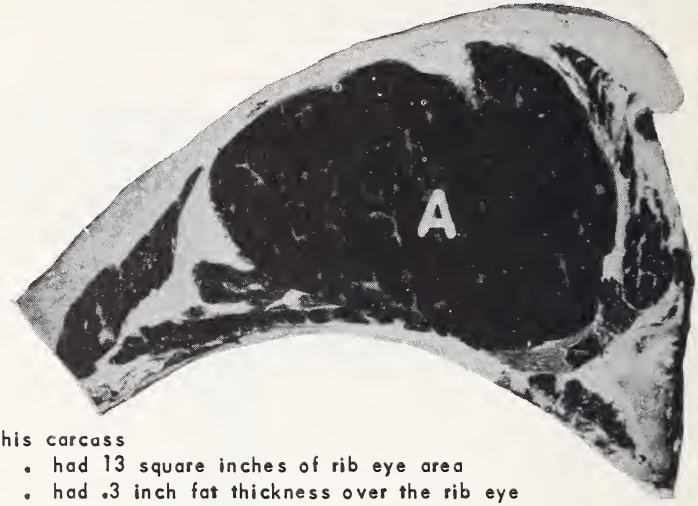
The story of the two steers on the following pages illustrates the "dual" grading idea. (Choice grade is used merely as an example. A similar story could be told for other grades.)

These steers were not of equal value

- Although -

THEY - Graded the same - U. S. Choice
Weighed the same - 1150 lbs.
Brought their producers
the same price - $24 per cwt.

HOW CAN YOU TELL? LOOK AT THE FOUR FACTORS



This carcass

- had 13 square inches of rib eye area
- had .3 inch fat thickness over the rib eye
- 16 lbs. of kidney fat
- weighed 700 lbs.

It would yield a high percentage of the preferred retail cuts --would be in Yield Grade no. 2.

HOW MUCH WOULD CARCASS "A" BE WORTH TO THE RETAILER?

YIELD AND VALUE OF TRIMMED BONELESS RETAIL CUTS

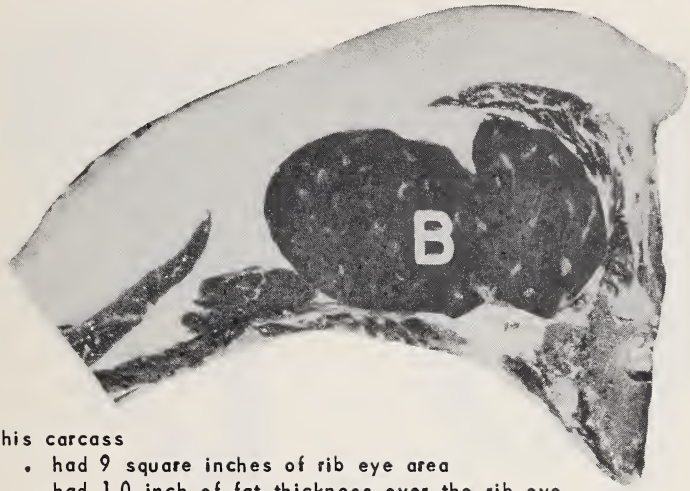
CARCASS A

USDA Choice
Yield Grade 2

	% of Carcass Wt.	Lbs.	Value
Boneless Major Cuts (from round, loin, rib, and chuck)	50.9	356.3	$427.56
Boneless Minor Cuts	8.3	58.1	43.58
Lean Trimmings	10.6	74.2	43.78
Fat	16.6	116.2	2.32
Bone	13.6	95.2	.48
TOTAL	100.0	700.0	$517.72

DIFFERENCE IN VALUE

THAT AFFECT YIELD OF RETAIL CUTS



This carcass

- had 9 square inches of rib eye area
- had 1.0 inch of fat thickness over the rib eye
- had 28 lbs. of kidney fat
- weighed 700 lbs.

It would yield a lower percentage of the preferred retail cuts --would be in Yield Grade No. 6

HOW MUCH WOULD CARCASS "B" BE WORTH TO THE RETAILER?

YIELD AND VALUE OF TRIMMED BONELESS RETAIL CUTS

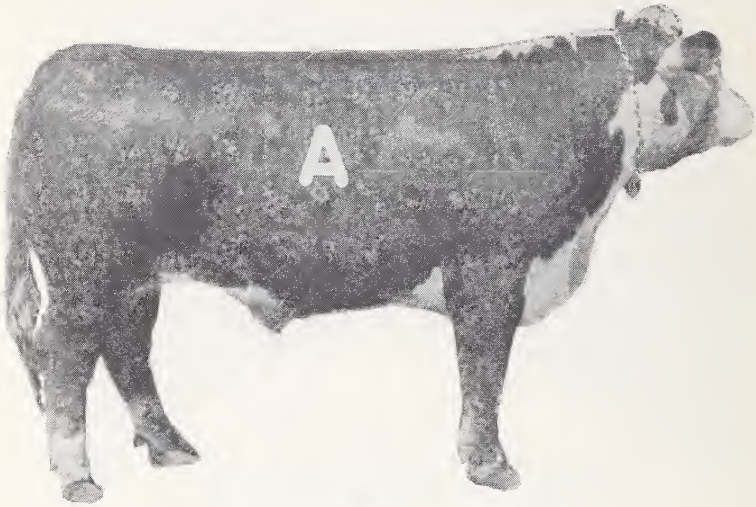
CARCASS B

USDA Choice
Yield Grade 6

	% of Carcass Wt.	Lbs.	Value
Boneless Major Cuts (from round, loin, rib and chuck)	42.9	300.3	$360.36
Boneless Minor Cuts	7.9	55.3	41.48
Lean Trimmings	9.2	64.4	38.00
Fat	26.9	188.3	3.77
Bone	13.1	91.7	.46
TOTAL	100.0	700.0	$444.07

TO RETAILER--$73.65

YIELD DIFFERENCES CAN BE

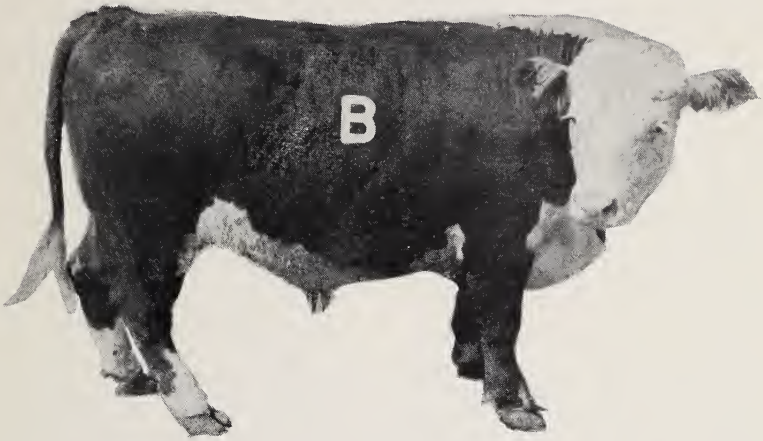


This steer had -

- Thick muscling over the back, bulging rounds
- Thin fat covering
- Trim brisket
- Firm finish

This meat-type steer fulfills the desire for high quality beef with a minimum of fat. He yields a high percentage of lean meat.

RECOGNIZED IN LIVE CATTLE



This steer had -

- Thinner muscling, flat rounds
- Thick fat covering
- Wasty brisket, full flank
- Less Firm Finish

This over-finished steer produces high quality beef but yields less meat and more fat than the meat-type steer.